Notebook, PN-04-07-21

This pocket notebook was used by Edison and an unidentified employee, probably during the summer of 1904. Many of the entries relate to production costs for Edison's alkaline storage battery. Included are labor distribution figures and notes on piecework rates, materials, and other manufacturing costs. There are some similar figures for the Edison Portland Cement Co. In addition, the book contains entries by Edison regarding experiments to be performed, including work on storage batteries and a Lansden electric vehicle. Also included is a list of machinery necessary for manufacturing rubber parts. Inserted into the book is a report on labor and material costs at the Edison Storage Battery Co. works in Glen Ridge, New Jersey, for the week ending July 13, 1904, along with 2 pages of loose notes. The front cover is stamped with the British royal crest. The pages are unnumbered, and several pages have been removed from the book. Approximately 50 pages have been used.

PN-04-07-21

Nickel mix per 18 plate Cell
on hand 3.420 per pocket,
985 grammes, or 2.2 lbs

Iron 1.75 lbs per 18 plate Cell,
4.9 per pocket
E

KOH 21% solution in 18 plate
Cell 1200 CC,
Solid KOH in this solution
297 grammes or 1 lb 1 oz of lb-
get 4 or 27 + 95
E

Weight of ♣ Separator
1.2 grms Each
Weight of 75/1000 sliced
separators 1 gram E
Each-

Weights –

18 plate, ☐ side rubbers weight. Pair 3815 grms

" " ~~Side sheets~~ Coat pa

" Side rubber sheets "

" Coat " "

" Bottom rubber weight 24 grms

Coat, per lb

Rubbers hard in the cloud, weight

Coat, per lb

Rubbers soft in the cloud weight

Coat per lb

Thumbnut rubber parts wt-pair 619 grms

Coat, per lb

Rubber soft on filter wt

Coat, per lb

Rubber bottoms, wt

Coat, per lb

Rubber diskapart wt

Coat per lb.

Crate quadrasepartions wt Coat

Total wt Coat per lb Total Coat

Chemical Works.

	rate.	week
Workchman —	18c	16
Foreman Davy	20¢	16 80
" Wright	20¢	16 80
Foreman — Savery-Ford		24 00
Foreman Fe & annealing —		23 50
Foreman No 2 - Ni. grafetipa		12 00
Time & book keeper		12 00
Storeroom		15 00
Chemist —		25 00
Asst Chemist		12 00
Test cup maker & washing		8 00
Errand boy		5 00
~~[illegible]~~		
Test man		12 00
"		9 00
"		10 00
"		7 00
Machinist —	32.5	
Pipe fitter,	22.5	
2nd grade machinist	20¢	
Temporary Machinist for lab.		

Chem Wks Continued.

No 2 bldg

1 Laborer -	15
1 "	15
1 "	15
1 "	17.5

No 5 main bldg -

7 Laborers	15c
1 Hydrogen plant.	15

Yard gang

3 Laborers, hauling etc	15
1 Rog Carpenter	25c

Gross & Gum -

Average rate.

$217. per day

Burn June 24th

16145 lbs Coal 24 hours 7.2 tons.

Oxalic acid used per lb of
Fe Mix. 5.25 c lb
H_2SO_4 1.85G. 100 lbs $1.20

Water now — 1.75 c lb. in pump pit
M1 — 25 E
NaOH, 2.65 per 100 lbs 98%
KOH-Electro 7 c lb — 98% —
Mercury 66 c lb. including
bottles, have about returning or
getting credit —

Graphite. 7½ c lb. 85 to 88%
HCl — 1.25G 1.6 c lb.
HNO_3 — 1.40 sp G 3.75 c lb
BaOH — get bill of last from Europe
Na_2CO_3 — $10H_2O$. 3/4 c lb Recrystl
H_2O_2 10 c lb — 1/2 strength Hydrogen
filter bags — linen 62½ c yard
Coat scrubbing
Cost Water 1/2 c 1000 gal —

filtering Canvas 54c yard
Ammonia 8½ lb.
Oil
Lamps
Packing
Chromic acid

E

Nickel Hydroxide
Plant working up Cost

~~Nickel Sulphate Solution~~

Cost of CP Nickel Sulfate Solution

107 lbs Nickel 25 c	26	75
120 lbs Brunsten Vitriol 1 20	1	44
Nitric a. 7 lbs 6½ c lb		45
Carb Soda 25 lbs 3/4 c lb		20
Labor 10 hours 17½ c h	1	75
" 4 " 20 c h - (½ of foreman)		80
	31	39

Yield - 975 liters
Cost per liter 3.22 c

Nickel Hydroxide

1114 liters Ni Solution at 3.22	35	87
300 lbs Caustic Soda 2 65/100	7	95
2000 gal distil H_2O 3/10 c gal	6	00
Labor 20 hours 17½ c	3	50

Foreman 1/2		1 35
Cost Lime filler	E	1 60
		56 27

Yield 200 lbs
dry hydroxide –
28.14 cents per pound.

Nickel mix in cans –

150 lbs Ni hydrox	E	42 21
42.3 lbs graphite.		7 19
$5\frac{1}{2}$ liter KOH. $4\frac{6}{10}$ lbs		25
Labor 10 hours at 20c		2 00
1/2 of foreman – 40c		40
		52 05

Yield 1913 lbs – E
27 cents lb –
In cans with little help from unlabored –

~~Iron mix = Black~~
~~Doped Iron Can~~

~~= 120~~

~~120~~ 80 lbs per day
of Fe_2O_3 —

Oxalic a 130 lbs	6	82
280 lb Fe_2SO_4 at .3/10c		84
2000 gals distilled H_2O	6	00
Labor roasting 5 hours 15c		75
gas for roasting 2000 cf 700 S=1		40
		15 81

80 lbs 19.8c lb —

To get this into Black mix

120 lbs Fe_2O_3 at 19.8¢	23	76
240 H_2SO_4 for Iron	2	88
20 lbs Dope 66 @ NgA	13	20
200 lbs Metal Fe 17½	3	50
labor 1 man 5 h at 15		75
" 1 " 5 "		75
1 5 " "		75

E

1/10 Foreman 1 hours 40¢		40
3/10 " 5 " 25	1,	25
Coke for purifying H, 900 lbs at 75¢ ton		90
Coke on Iron reducing furnace 1600 lbs 800 per ton of 75¢ lb	2	75
Labor mixing. Cooling	1	50

Yield 124 lbs black
mag Copper
41.4 C lb.

Treating Rubber for Cables

Cast nickel welding -

Rods

Cam sticks

Seats,

Graphite Coatings.

KOH Electrolyte →

Labor assembling [illegible] plate Cell
" 27 "
45 "

Labor soldering + inserting
[illegible] in top plate 18 p cell
" 27
" 45.

[illegible] Cost Carrying [illegible]
[illegible]

Cost room costs daily

[illegible] Dock, [illegible]

Forest [illegible] [illegible]
" Coal
" Oil
" [illegible]
" Coal [illegible]

[illegible]
[illegible]
Naptha, 5'

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Things necessary to increase capacity Plank & Strike finishing

1. 200 18 platers chainless —

Press dept 2

2 Hydraulic press 12" Ram — ordered
1 Intensifier "

Perforating dept 3.

2 perforating Machines Ordered Otturkey
~~1 Spindle drill — On hand~~
2 2nd hand Screw Mac 1 on hand (On hand)
3 acme SM ordered
2 5/8 Cutts Screw M space Washer — ?
~~1 Oil Separator — Ordered~~
~~1 Soda Kettle "~~
~~2 1½ Shafting "~~
~~1 20 HP Motor, to 40 HP. on hand~~

Brequetting dept
1 Nickel filling Mac

Assembling
~~1 Boiling Tank - Outward~~

6 Strip plating Mac
2 new Gang stands at Lab -
going ordered 4 more -

Boiler Room
Boiler from Mine -

Rubber parts Cost.
£ 18—

Pole washer	1 3/4 Cents	- 3.5 C
" Insulator	1.4 Cents	2.8
Stuffing box gasket.	.85 Cent	1.7 Cent
Gland Cup	3½ C	7 Cents
Lip gasket	.85 C	
Side insulator	7 C	14
Superior Top gasket	0017	—
Pocket Insulator, Separator	1⅛ C	9.5 Cents
Bottom Insulator	9 C	
Plate insulator	11 C	22
Block Insulator	2 6/10 C	
Cell Separator right	3.65/100	7.3
left	3.65/100	7.3
Middle	4½ C	9 Cents.
	Total	1.8285

Total £ 27 25992

Elbright Complete of

E-18- Σ 12.5 to 12.75

E 27 — 17.25 to 17.5

E 45 29.75

Prices compared [illegible]

18F

[illegible] Side Seam	.35	per	100
[illegible] Square Stock	[illegible]	c	"
[illegible] Stock	6		"
[illegible]	[illegible]		
[illegible]	4 1/4	cents	"
[illegible]	6		"
A Wire	7 1/2		"
B Platz			"
C Unwire	7 1/2		"
Trim	4 1/4		"
Corrugate side	31		"
" end	31		"
Mark patent	6		"
Notch end short	8		"
" " long	8		"
Edge	11 1/2		
Bead 1st Operation	11 1/2		
2 "	11 1/2		
3 "	11 1/2		
Side seam	1.00		
#402 Can side	2.00		

203 Can bottom	2	cents	100
Draw —	4		
Trim	4		
A cover	3 1/4		
C Unwire	3 1/4		

Cover group C Cut 18 cents 100

[illegible] — assembl[illegible]

Clean	18
A wire	2 1/2
C Unwire	2 1/2
[illegible]	15
[illegible]	15
[illegible]	15
[illegible]	9

[illegible]

Cut blank	2 cents
1st Draw	4
2nd "	4
Trim	4
Size	4
Aree	4
A wire	2 1/2
Unwire	2 1/2
Draw Eylet	5 1/4
Bellmouth Eylet	5 1/4
Mark plus	4

106 –

Stuffing box 107

A wire 3 cents 100
C unwire 3 1/4

~~Rubber washer~~

Gland –

Coil Cut in rings Bend
4 A wire 4 B Plate 4 C unwire

Valve box

A wire 3 1/4 100
C Unwire 3 1/4
flutter Valve seat 4C

Separator Valve set

Form
Burr
A wire 1 1/2
C Unwire 1 1/2
Swedge 4 1/2

Seperator Top

Drill 2 small holes	25 per 100	
Countersink	3c	
A wire	3 1/4	
C Unwire	3 1/4	

Baffle

Blank	1 1/2
Punchholes	2 1/2
Form	2 1/2
A wire	2 1/2
C Unwire	2 1/2

Baffle Spring

Screen

Shear	
Blank	2 c
A wire	3 1/4
C Unwire	3 1/4

Screen spring

Coil — 100

Cut to size

a wire

C wire

Filler Gody

A wire 3 1/4

C wire 3 1/4

Levers band group

assemble 9c

Notch 8c — 100

Hungz band

Blank 1 1/2

Ream

1st Draw 3 1/4

flatten 2 1/2

Pierce 5 5/8

2nd Draw 5 5/8

Trim 5 5/8

3rd Draw 5 5/8

Stop Notch 5 5/8

Ream holes	5	
Countersunk		
~~B~~ a wire	3 1/4	
C unwire	3 1/4	
Lid lever		
Blank	1 5/8	per 100
Pierce	2 1/2	
1st bend	2 1/2	
2nd "	4	
Clip	1.5/8	
Ream Countersunk	8	
wire	3 1/4	
unwire	3 1/4	
lever pins -		
Cut to length		
wire		
unwire		
Lid assemble	9	
Close	3 1/4	

Lid Cap		
Blank	1 1/4	100
Draw	3 1/2	
wire	3 1/4	
unwire	3 1/4	
Lid plate		
Blank	1 5/8	
Pierce	4	
Stamp	2 1/2	
Recut Counter	5	
wire	3 1/4	
unwire	3 1/4	
Lid Gothic		
Cut + draw	1 5/8	
Reduce	5 5/8	
Trim	1 5/8	
1st flatten	4 1/4	
2nd "	2 1/8	
wire	3 1/4	
unwire	3 1/4	

Hinge Cotter
Wire $1\frac{1}{2}$
Unwire $1\frac{1}{2}$

Hinge Spring
Cut to length
Wire $1\frac{1}{2}$
Unwire $1\frac{1}{2}$

Nickel plate,
Stamp grid
Set in pockets 35 c 100
Roll 5
1st press 15
2nd " 15

Grid
Shear stock 2 3/4
Blank & pierce 6

Wire 3 1/4
Unwire 3 1/4

Nickel Rocket group
Filling inside cups
Assemble #141 + #142
Close
Remove
Inspect
Roll
Size
Inside Cups
Reel stock
Perforate
Flatten
Press into cups
A put in rack .10 load
B plate
C remove from rack .04 "
Anneal
Put in holder for f. mch. .12 1/2 "

Outside Cups.

Reel stock

Perforate

Flatten

Press into cups

A put in rack .10 load

B plate

C remove from rack .04 "

Anneal

Put in holder for f. mch. .12½ 100

Nickel Powder

Positive Pole Group

Assemble

A wire .03¼ "

B plate

C unwire .03¼ "

Re-thread

Positive Pole		
Mill head	.75	100
Drill		
Ream	.75	100
Burr		
Re-thread		
Grind taper		
Positive Connecting Rod		
Forming + thread	.35	"
Thread one end	.15	"
File to guage	.35	"
" " "	.45	"
" " "	.55	"
Spacing Washers .375"		
Form		
Countersink	.12	1000
Grind one side	.16	"
Face to size	.10	100
Grind	.16	1000
A. wire	.01½	100

B. plate

C. unwire .01½ 100

Anneal

Spacing Washers .310"

Form

Countersink .12 1000

Grind one side .16 "

Face to size .10 100

Grind .16 1000

Wire .01 ½ 100

Plate

Unwire .01 ½ 100

Anneal

Spacing Washers .128"

Form

Countersink .12 1000

Grind one side .16 "

Face to size .10 100

Grind .16 1000

Wire .01 ½ 100

Plate		
Wire	.01 1/2	100
Anneal		
Spacing Washers .243"		
Form		
Countersink	.12	1000
Grind one side	.16	"
Face to side	.10	100
Grind	.16	1000
Wire	.01 1/2	100
Plate		
Unwire	.01 1/2	100
Anneal		
Spacing Washers .180"		
Form		
Countersink	.12	1000
Grind one side	.16	"
Face to side	.10	100
Grind	.16	1000
Wire	.01 1/2	100
Plate		

Brodrick & Clark

Rubber	12 lbs
Reclaimed R	25 "
Chalk	25
Litharge	12
Sulphur	1 3
Pitch	

Jim's formula

Rubber	12 lbs
Reclaimed	25
Chalk	25
Litharge	4
Sulphur	3
Lime	1/2
Zinc Ox	5 lbs

Reclaimed 13c Pacific

Unwire	.01 1/2	100
Anneal		

Spacing Washers .113"

Form		
Countersink	.12	1000
Grind one side	.16	"
Face to size	.16	100
Grind	.16	1000
Wire	.01 1/2	100
Plate		
Unwire	.01 1/2	100
Anneal		

Split Washer

Blank	.02 1/2	100
Flatten	.01 7/8	"
Split	.01 7/8	"
Tumble		
Spring tempered		
A. wire	.01 1/2	100
B. plate		
C. unwire	.01 1/2	"

Clamp Nut		
Blank	.05	1000
Flatten	.06½	"
Tumble		
Drill		
Tap	.10	100
Burr		
a wire	.01½	100
B plate		
C unwire	.01½	100
Clamp Nut Insulator		
Treat		
Pole Nut		
Form		
Tap		
Grind		
a wire	.01½	100
B plate		
C unwire	.01½	100
Negative Group		
Assemble		

Iron Plate Group

Stamp in grid		
Set in pockets	.40	100
Roll	.105	"
1st press	.15	"
2nd "	.15	"

Iron Pocket Group

Filling inside cups
Assemble #141 + 142
Close
Remove
Inspect
Roll
Sige

Iron Powder

Negative Pole

Mill head	.75	100
(Drill		)
(Ream	.75	")
(Burr		)

Rethread
Grind

Negative Connecting Rod

Forming + Thread	.35	100
Thread one end	.15	"
File to gauge	.35	"
" " "	.45	"
" " "	.55	"

Pocket Insulators
Treat.

Plate Insulators
Treat

Bottom Insulator
Treat

Side Insulator
Treat

Cell Connector Group		
Assemble		
Solder		
Plate	.03	100
Swedge	.06	"
Bend	.09	"
Connecting Wire		
Cut to length	.02	"
Straighten	.02	"
Cut thread	.13	"
Tin ends		
Connecting Lugs		
Pickle		
Tumble		
Rough ream	.85	100
Drill + Face	.85	"
Face	.10	"
Drill for Tap	.40	"
Tap	.08	"
Ream	.50	"

a. wire	.02½	100
To plate		
e inwire	.02½	"
Anneal		

Terminal Group

Assemble
Solder
Wind with tape

Terminal wire

Cut to length
Clean each end
Tin

Terminal Lugs

Pickle
Tumble

Drill & Face	.85	100
Face	.10	"
Rough ream	.85	"
Drill	.40	"

Beam	.50	100
Wire	.02 1/2	"
Plate		
Unwire	.02 1/2	"
Anneal		

Separator Top Gasket

Treat

Negative Pole Group

Assemble	.03 1/4	100
Plate	.03 1/4	"
Re-check		

all

Yet sale to date
Orders on hand
Stock on hand Cells
Payroll + rate,
Water Oil - Coal,
Supplies all Kinds,
Carting. gas.
Cyanide
Nickel anodes
Incandst Lamps
Autos, repairs
Packing — Crating
Cost Trays —

Rubber Machinery

Wm R Thorp
Trenton

16 Dia 27 face Washer
Crocker $675 =
HP. 20-

Grinder Mixer & warmer all
the same machine, steam
heated cylinder

16X42 — $650,

Hydraulic press —
15X15 — 8" dia Ram
2000 lbs per sq inch on
that compound —

Vulcanizer. 4 ft - 8 ft long dia
~~Cost~~ abt 300 t. 400 dollars
without Cars $95 each Car
2 cars

Callenders 2 ft length
3 Rolls 14,00 Chilled
14" dia -

157 · 2.68
139 11 98
228 211 00
98
622 225.66
225
847

12)1393(116
12
19
12
73

2703
81 09

3 00)1393
464

5)1393
278

6)1393
232

8)1393
174

11)1393(12
11
23
23

1	13.93
2	6.96
3	4.64
4	3.45
5	2.78
6	2.32
7	1.99
8	1.74
9	1.55
10	1.39
11	1.27
12	1.16

4 #
52

175

600.

1400

1200.

2

1400

3684
528
360
350
4922

600 / 4922 / 8.20

8.20
1.50
50

Experiments on Lansden Torrens
Board, Land knyltrusso + levelled
flat, fish scales – Tree short
Motor 64 – 56 56 56
Motor put forward when reversing lever
pumped Torrs hard
+ Read fish scales –
34 35 35

Oiled axles + put chain back
had change distance bars
had Cylinders oil
38 42 44
Slack and chain – 42 46 50 49 48
Ran out in yard + Gorsla
44 46

Running Watchung Ave
Level – good road
1st Match Amperes 33-37-40-42

2nd Match 47-52-52-
Coming back 33-29-27

3rd Match 50-48-53. } 41
Coming back 37-33-30-

4th Match 60-64-68
Coming back 54-47-48

Coming up Aldenst hill –
3rd Match 66-72-74-75

4th Match – 86 88 92-92
4th speed more faster than
Runabouts – 3rd speed very much
slower

If 21000 bbls work all ground
Cost 44.3 but no grinding 5c
for Extra Labor + Coal wear etc
49.3 per bbl

Coal Kilns 3000 bbls 235
" Power 7 Blns 2.65 194
430
397 men, 198 Boys, 177

Tops, Dies, Fire Jus Tiffany } 37
Stripper Thrill 18
Blunts 20 10
Rollers 10
Sub Spider 15
Chute wear 10
Lower belts 6
Running Kilns 20
Rovers, Short Stops 7
Roll Stoppers 27
Spoons 72
Sub Stoppers 60
Flights 3
Screw Conv 5
Worm roll plates 30 308
General Exp 37

$1552.

22000 Crushed at 550
1210

$342. day

Leaves abt 10000 per month Tied up in Blunkers
30000 bbls clunkers stocked per month.

Invoiced Phila afs apl may jun jly	22853
" works afs jun jly	34388
Reduce water due jun to Mar	55739
Pump roll to July 20	16 000
Unfilled orders 7/16 –	9296
	138276 –

of open orders – 30 000 of clay to put in water,
55 000 of finding water, can be reduced by
jun jly 30 of Bicarbonate –

FeOH. removes chromate
HgO. apparently removes
Ferrid Cy
HgO dont remove Chromate
MgOH removes Ferrid Cy
Lime OH " "
Millon partially " "
$BaCO_3$ " "
MgOH dont remove Cr
Millon apparently removes Van
Bi OH dont reduce Cr
Millon dont remove Cr
$BaCO_3$ dont remove Cr

12 cells 24 hours per
HP - 24 hours,

400 cells 32 HP 24 hours
$18 day 800 lb 2/3 cell for group
2 cells for room
Labor 2c Total 6 2/3c

32
3200 -
5000 per
1800
144
432

432 | 2743 cap | 6
2592

Refu

3½ ft hours 1 ft wide

2 V 140 amp
1600 ft step - 280 watts.

6 cells 24 hours ½ HP -
84 ft.

24
35
120
72
840

1
1
12
1746
1600

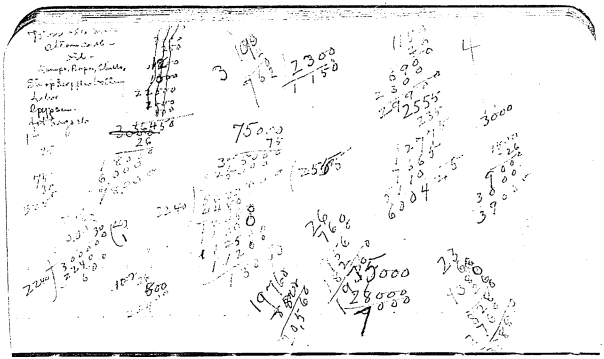
140
2
280

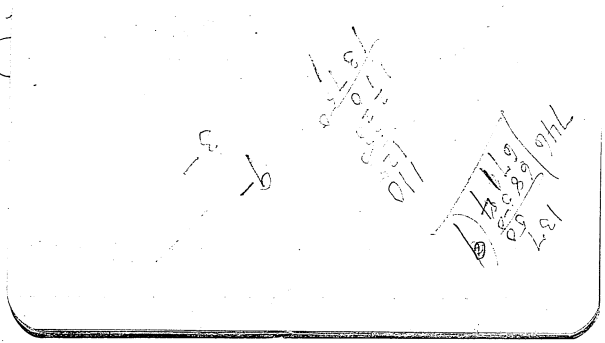
1600
12
3200
1600
1600
7 | 1746
1743

K Manganate is very sol in
Alkalis without change
Alkalis Sol has great tendency
to produce with certain oxides
precips which settle rapidly
+ are constant in composition
The Sol is also a powerful
oxidizer & certain compounds
are oxidized at ord temp whilst
permang K requires heat
+ large excess, lastly the
end of the reaction is
sharply defined green
color disappears + Sol is
colorless = to make
add (2 mol) KOH in a
crucible some H_2O added &
finely ground permanganate
K (2 mol) gradually
added with constant stirring
+ heating after 2 hours

fusion + heat crucible
cooled + residue placed in
well stopped bottle to prevent
access air + organic matter

Cobalt in KOH is poly bad
as it forms high + low oxides
whereas the chart is usual





165

125
42
250
500
225

5250
35
26250
15750
18375

746)

5250
50
2625
60
746)15750
7462
8290

1837
60
1102
746
356

(14

746)15750
1492
4360
7460
8900

(746
2011)

1505
746
759

(12

746)15750
1492
4360
7460
8900

1505
60
90300
43
35
215
129
1505

(156
2)

903
936
147

750)

200

24
6
144
200
28800
210
28800
57600
604
446
158
1358
2500

(135 60
60
67.50

67.50

200)2500(12
200
500

2200
30.00 (20

150)

446)28800
57600
2
446
1800

(13

135
17
945
135
2295

14
23
50
115

~~900~~

24" lever moves 628
850 Rev in a lou
weight on end lever to
start wheels rolle
1 lb 7 oz

at full speed end lever goes
5338 ft minute. which at
1.44 lbs is 7686 lbs pull
this is less than 1/4 HP to
start.

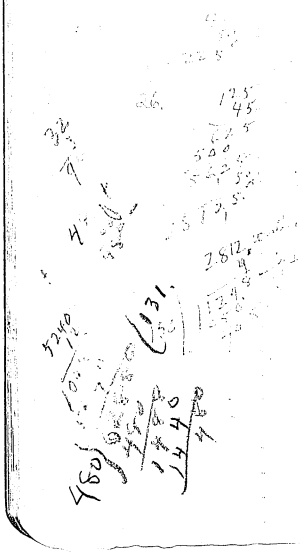
64 lbs to move Lunsden on
floor -

7686 | 33000 (43
744 | 30744
22560

Mats, presdt V.L.

Firestone Tire Co
N York
Broadway near 58 st

12 w. [illegible] 131 Rev —



42 E 27

Lansden Journeman

		amp
Motor only	1 notch	9
	2	9
	3	8.5
	4	13
Motor & jacket	1st notch	13
	2	13
	3	14
	4	23
Motor, jacket & heads	1st	15
	2	15
	3	15
	4	23

45
39
225
35
157
72
128
20) 3844
300
600
24
21
8
4
3
4
5
45
62
72
150.00
225
125
125
50
225
281.25
281
45
405
144
1126
2643
233
384
350
233
225
12
306
36
225
16
2
47 48
48
53
37
33
30
6) 248
41.3
41 amp

[ITEM FOUND IN BOOK]

EDISON STORAGE BATTERY CO. GLEN RIDGE, N.J.

LABOR AND MATERIAL

WEEK ENDING JULY 13,1904

	Labor	Material
Executive,Engineering,&c.	$157.08	$ 2.68
Office	139.22	11.98
Selling Dept.	84.62	26.00
Manufacturing Dept.	1393.19	883.01
Testing Dept.	78.93	3.63
Packing,Shipping & Store room	71.22	
Repairs & General Maintenance	228.72	211.42
General shop gang	98.01	
Power	60.33	122.95 Coal 18.92
Freight & trucking	13.90	59.21 DLW
Supplies for tool room		4.20
New Construction	18.15	64.36
New Machinery & Tools	360.13	656.51
Fire protection		12.60
Interest & Discount		1.88
Total	$2703.50	$2079.35

$4782.85

1098.35

3684.50

360

1098

92 614 | 3684.50 | 6,

1098 | 3684

[ITEM FOUND IN BOOK]

For a longer time special electrolyte of unassembled with good charged PbO_2 & some new Pb. [illegible] without the [illegible] charging [illegible] Experiment [illegible] are falling charged [illegible] [illegible]

	2166						
2K	2165						
	2164						
$NaPbO_4$	2153	3108	1132	[illegible]	1057	853
"	2154	3107	1005	[illegible]	1104	807
K_2PbO_4	2153	3106	1077	[illegible]	991	857
"	2152	3105	1040	[illegible]	1041	857
$KpT\ Cy$	2151	3104	117	[illegible]	810	577
"	2150	3103	183	[illegible]	187	220
K_2TiO_3	2149	3102	1097	[illegible]	1038	857
"	2148	3024	1085	[illegible]	1032	870
K_2MnO_4	2147	2023	833	[illegible]	950	860
"	2146	3020	[illegible]	[illegible]	1010	503
$K\ Cy\ O$	2165	3119	717	[illegible]	1183	770
PbO_2	2165	3118	1126	[illegible]	1043	873
"	2164	3117	987	[illegible]	987	863
KI	2163	3116	1172	[illegible]	1052	867
"	2162	3115	1247	[illegible]	1147	857
NH_4VO_3	2161	3114	87	[illegible]	98	93
"	2160	3113	33	[illegible]	56	55
K_2CrO_4	2159	3112	520	[illegible]	1043	572
"	2158	3111	280	[illegible]	183	63
K_2MnO_4	2157	3110	810	[illegible]	1177	726
"	2156	3109	113	[illegible]	1066	772

Reg Mass.

[ITEM FOUND IN BOOK]

Ni's charged in the special electrolyte & [illegible] with good charged Fe & run in fresh 1% KOH without further charge. They [illegible] all be found [illegible] the gold float the [illegible] before as [illegible]

Ed	cell #	To .5V	C.V.	2nd R. chg Kr [24 hr chg]	3rd 33/4 hrs chg .50
2155	3108	1038	663	1326 900	883
2154	3107	1108	1001	1246	905
2153	3106	1133	992	1340	925
2152	3105	1153	833	1303	860
2151	3104	1400	836	1353	900
2150	3103	1080	466	1443	883
2149	3102	1130	1083	1312	933
2148	3024	1111	843	1206	907
2147	3023	1353	1116	1250	867
2146	3020	940	803	1263	933
2166	3119	1150	1013	1207	900
2165	3118	1110	787	1320	933
2164	3117	1133	760	1243	900
2163	3116	1047	817	1153	900
2162	3115	473	313	533	450
2161	3114	1157	947	1327	933
2160	3113	53	17	1387	860
2159	3112	1133	923	1137	900
2158	3111	1220	30	1273	900
2157	3110	1217	10	1367	860
2156	3109	1317	83	1293	930

(margin note beside 2nd R column: short 12hrs)

Reg generally gives 1200 To .50